

Title (en)
ELECTRICALLY DRIVEN PUMP

Title (de)
ELEKTRISCH ANGETRIEBENE PUMPE

Title (fr)
POMPE À ENTRAÎNEMENT ÉLECTRIQUE

Publication
EP 3115613 B1 20220126 (EN)

Application
EP 16176902 A 20160629

Priority
CN 201510393337 A 20150706

Abstract (en)
[origin: EP3115613A1] An electrically driven pump is provided, which includes an impeller. The impeller includes an upper plate, blades and a lower plate, and the blades and the upper plate are integrally formed by injection molding. The blades are formed on a lower surface of the upper plate, the blades include first blades and second blades, and a length of each of the first blades is greater than a length of each of the second blades. The first blades are uniformly distributed along a circumference of the upper plate, and the first blades and the second blades are distributed alternately in a circumferential direction of the upper plate. Each of the first blades includes a first head portion and a first tail portion, the second blade includes a second head portion and a second tail portion, and each of the first tail portion and the second tail portion is aligned with an outer edge of the upper plate. The outer edge of the upper plate defines a first circumference with a diameter of d_1 , the second head portions of the second blades are located on a second circumference with a diameter of d_2 , and the diameter d_2 of the second circumference ranges from 60 percent to 75 percent of the diameter d_1 of the first circumference. The impeller arranged in such manner facilitates the improvement of a hydraulic efficiency and a lift.

IPC 8 full level
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CPC (source: EP US)
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Citation (examination)
• JP H09310697 A 19971202 - OGIHARA SEISAKUSHO KK
• CN 201843822 U 20110525 - HEFEI XINHU SHIELD PUMP CO LTD
• US 2013164136 A1 20130627 - VESTERGAARD BOLL JENS [DK]

Citation (opposition)
Opponent : KSB SE & Co. KGaA
• CN 201843822 U 20110525 - HEFEI XINHU SHIELD PUMP CO LTD
• JP 2010065528 A 20100325 - NIDEC SHIBAURA CORP
• WO 2013124314 A1 20130829 - NUOVO PIGNONE SRL [IT]
• EP 2402112 A2 20120104 - TURBOCAM INC [US]
• US 2006140767 A1 20060629 - GARMAN BRIAN [US], et al
• EP 0623752 B1 19980909 - KSB AG [DE]
• CN 202170891 U 20120321 - XIAODONG HUANG
• CN 101865157 A 20101020 - NO 70 INST OF CHINA NORTH IND GROUP CORP
• CN 203570667 U 20140430 - ZHEJIANG TONTOP PUMPS CO LTD
• JP H09310697 A 19971202 - OGIHARA SEISAKUSHO KK
• CAVAZZINI GIOVANNA, ET AL.: "Using splitter blades to improve suction performance of centrifugal impeller pumps", PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS, vol. 229, no. 3, 1 January 2015 (2015-01-01), XP055978706
• MILLER MAX JOSEPH, ET AL.: "Detailed Performance of a Radial-Bladed Centrifugal Pump Impeller in Water", NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, 1 January 1969 (1969-01-01), XP055978707
• HARTMANN MELVIN J: "Design and Experimental Performance of a Small Centrifugal Pump for Liquid Hydrogen", NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, 1 January 1960 (1960-01-01), XP055978708

Cited by
GB2574221A; CN109595186A

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